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EMPIRE COTTON GROWING CORPORATION.

REPORT OF THE ELEVENTH ANNUAL GENERAL MEETING.

The Eleventh Annual General Meeting of the Corporation was held at the offices of the Corporation in London on Thursday, 26th May, 1932. In the unavoidable absence of the President of the Board of Trade, the Chair was taken by the Rt. Hon. The Earl of Derby, K.G.

LORD DERBY, in presenting the Annual Report of the Council, said :

Gentlemen, The President of the Board of Trade has asked me to express his regret that he is unable to be present with us. We all know the keen interest Mr. Runciman takes in our work. We do not forget that he was at the Board of Trade at the time when the negotiations were proceeding which led to the appointment by his successor of the Empire Cotton Growing Committee, to whose recommendations we owe our existence. We likewise appreciate the terrific burden of work that the circumstances of the times impose upon Ministers, and when to that are added the burdens inseparable from the holding of the impending Conference at Ottawa, there can be no one in this room who will not fully appreciate the excellent reasons he has for not being here to-day. We can only wish him well in the great task he has in hand.

Before turning to general topics, I desire to make a few personal references. I am sorry to report to you that ill-health has compelled Mr. Crinion to retire from the Council. He has been a valuable member of Council for many years, and we all wish him well in his retirement. I have known him

personally for more years than I care to remember, and although we have been opposed in some political matters, we always remain the greatest of friends. Mr. Ashley, who has so ably represented the Board of Trade on our Executive Committee since the Corporation's inception, has now left the Board and has been appointed Secretary to the New Import Duties Advisory Committee. Our knowledge of Mr. Ashley and our confidence in him, acquired during the course of many years, make us feel certain that he will be equal to the difficulties of the situation—and they are not light—and most assuredly in saying so I pay him no mean compliment. I desire to thank him for the unlimited help he has given us in the past, and to wish him well in his new work. Fortunately we do not lose touch with him entirely, as I am glad to say he has consented to accept co-option as a member of Council. We welcome Mr. Browett as Mr. Ashley's successor.

We have lost a good friend, too, in Mr. John Murray, of the Foreign Office, whose local and technical knowledge often enabled him to render valuable assistance to our staff.

I have already congratulated the Chairman of our Executive Committee on the well-deserved honour His Majesty has conferred on him. (Applause.) Nobody deserved an honour more than he. I would add an expression of pride and satisfaction that he has been selected as one of the representatives of the Cotton Trade at the impending Ottawa Conference. My own feeling about the Conference is that, while I cordially welcome it, I am very apprehensive of what appear to me to be exaggerated hopes as to its possible—and still more as to its immediate—effects. No development of inter-Imperial Trade can take the place of Lancashire's great world markets, valuable though such development may be. I can conceive no man better equipped than Sir Richard Jackson to preserve a detached view and keep steadily to the fore the permanent interests of the great textile industry. No one, I am sure you

will agree with me, is less likely to succumb to the effects of a local atmosphere that is sure to be subject to all kinds of enthusiasms and perhaps divergent interests.

I now turn to what must constitute the main subject matter of these remarks—our actual work. I will begin by quoting the first paragraph of the Report, the adoption of which I am about to move. It runs :—

" Reduction of general purchasing power, currency dislocation, and a steady augmentation of the deadly toll that politics continue to take of economics have all been contributing causes to the commodity slump which has confounded every reasonable calculation." That is a somewhat involved sentence which simply means that we are all of us hit in a very disagreeable fashion by the present economic situation.

This is due to the world-wide crisis in finance and you will not expect me to express any opinion on this most thorny question or as to what measures are possible to combat the calamity, for in that light it must be regarded. It is clearly no exaggeration to state that if it be not arrested—and it is difficult to see how it can be arrested by unilateral action on our part (I have learnt this use of that word from an intelligent study of recent Foreign Office documents)—all hope of trade recovery is a dream, and we are faced with the possibility of a world collapse, and that perhaps in the no distant future. It is a gloomy view to take, but it is as well always to look on the dark side of the question and then to remember that there is always a silver lining to the cloud.

Considering the difficulties under which all primary producers are at present labouring, I do not consider our figures of cotton production are discouraging. They show a reduction in yield of 8 per cent. on those of last year. It is interesting to look at the figures and see how heroically the native producer stands up to the storm. I instance in particular Uganda and Nyasaland.

It is curious how much loose talk is current about over-production of raw cotton. Not much more cotton is being grown in the world to-day than in 1912-13. The fall in consumption is the real tragedy.

I turn now to the progress of some of our main producers. I will begin with the Anglo-Egyptian Sudan. Both Sir William Himbury—whom I am glad to see here to-day—and your Director have visited the Sudan this year. As you will see from the Report, the Sudan has had a very good crop this season, even better, judging from the most recent information, than stated there. It will apparently be a trifle more than four kantars per feddan. The Kassala concession, in which you have a substantial interest, has done particularly well. But there is no doubt that the country, in common with all others, is passing through a difficult period. It is not hard to see the cause. Irrigation works and railways constructed at one price level have to pay interest in terms of a commodity or commodities which have depreciated beyond all reasonable calculations. The Sudan Government is doing its utmost to combat the present crisis. We have so long been accustomed to consider it as one of those spots in which wise administration is a tradition that I criticise with real reluctance. I do, however, feel bound to say that their determination to cease supporting the Imperial College of Tropical Agriculture in Trinidad is a grave error. The decision has come as a great surprise to our Executive, who have asked for an interview with the Governor-General during the coming leave season. I deplore the decision, and I still hope that wiser counsels may yet prevail.

Both Sir William Himbury and your Director speak in the highest terms of Mr. Bailey's work on the Research Farm, and of the confidence he has inspired.

I can only wish Sir John Maffey and his administration good fortune in their struggle with economic difficulties. Such difficulties are not of their creation, and are common to the whole world.

No other part of the world in which you are interested calls for special mention. The Uganda crop was a good one. Uganda is largely staffed by your former Students, now in the Colonial Office Service. They will shortly be reinforced by Mr. Jameson, who is spending a year with Mr. Parnell at Barberton, and will, I am sure, prove a valuable recruit to the Uganda agricultural staff when he reports for service there.

Southern Rhodesia is still in the grip of foot-and-mouth disease, which upsets all their agricultural balance, but the Experiment Station at Gatooma continues to do good work, and their crop is described as of good quality.

In the Union of South Africa, Barberton continues its investigation into bollworm, the great enemy of cotton from the Pongola river to the Zambesi. Mr. Milligan, our senior representative in South Africa, has had a very busy year. At the request of either the Colonial Office or the Dominions Office, he has visited Northern Rhodesia, Tanganyika, and Swaziland, and in each case very full tribute has been paid to the help he was able to render.

Cotton-growing in the Union of South Africa, in common with every kind of agriculture, is passing through a most direful time. Heaven forbid that I should discuss or criticise the Gold Standard policy which the Union Government have adopted. It is quite clear, however, that it inevitably hits the primary producer very hard. I would instance the Dutch East Indies as another example, if any analogy is needed.

I now turn to two spheres of work in which we are deeply interested, and which we have supported to the best of our ability.

The Imperial College at Trinidad, where all Colonial Office cadets receive a year's post-graduate training, has naturally been much affected by general financial conditions. So serious did the position become that the Governing Body of the College, in conjunction with the University of Cambridge, your Executive and the British Cotton Growing Association, asked the Secretary of State for the Colonies to receive us in deputation. This he consented to do, and it fell to me to introduce the deputation. We got an encouraging reception, and went away feeling that the value of the work done by the College was fully appreciated, and that, even in these difficult times, it would receive all possible consideration.

The Oversea Mechanical Transport Directing Committee, of which our Director is Chairman, has had its full share of financial difficulties. While fully conscious of the difficulties of the times, I cannot help feeling that, in present-day circumstances, the technical assistance that the West can render to the East is likely to bulk at least as largely in the opinion of the coloured world as the work of the direct administrator, and to be a factor of increasing importance in forging links of good-will. I therefore deprecate the closing down of admittedly important technical research unless sheer necessity compels.

I do not propose to prolong these remarks further as we are fortunate in having with us to-day Sir John Russell, of Rothamsted, who is going to talk to us on Science and Cotton Supplies. Rothamsted and its work are household words in agricultural research both at home and all round the world, and I know you will hear Sir John with the keenest interest.

In conclusion, the second period of five years for which the Levy is in force will come to an end in about fifteen months. For reasons stated in the Report, with which I am in full agreement, your Executive have unanimously determined that, as the present Act is coming to an end, the Corporation shall approach the Government with a view to the introduction of a

new Bill continuing the levy for a further period of five years at its present rate of 1d. per bale. It has already been ascertained that this policy commends itself to the principal Associations and firms representative of the Spinning Industry, and I have no doubt that the Trade as a whole will endorse it.

I formally move the adoption of the Report.

The Chairman then formally moved :—

" That the Report of the Council with the Accounts of the Corporation audited up to 31st March, 1932, be and they are hereby adopted."

MR. BUTTERWORTH : I have pleasure in seconding the resolution for the adoption of the Report. Those members who have taken the trouble to read the Report must be impressed by the vast field covered by our activities and the magnitude of the task the Corporation has taken up. They will note with gratification the manner in which difficulties of all sorts have been faced and overcome.

THE CHAIRMAN : The Report and Accounts are now open for discussion and for any questions. . . . As there are no questions I will put the resolution to the meeting.

The resolution was adopted unanimously.

MR. A. FOSTER (Chairman, Finance Committee) : I have pleasure in moving :—

" That Messrs. David Smith, Garnett & Company be and they are hereby re-appointed Auditors to the Corporation, and that authority be given to the Executive Committee to fix their remuneration on completion of the audit."

MR. C. R. SHAW : I have pleasure in seconding that.

The resolution was carried unanimously.

THE CHAIRMAN : That concludes our business, but we are now to listen to an address by Sir John Russell, F.R.S., Director of the Rothamsted Experimental Station, who is to talk to us on " Science and Cotton Supplies."

SIR JOHN RUSSELL spoke as follows :—

My Lord and Gentlemen,

It was with great pleasure that I accepted Sir James Currie's invitation to address you for a short time to-day. Like other technical experts, I have great admiration for the work your Corporation is doing and for the broad-minded way in which it is approaching its very difficult problems. And although not directly concerned in the working up of cotton in this country, I never forget that for a time I was dependent on cotton when I spent part of my youth in the little town of Padiham in north-east Lancashire. There were still living many people who had been through the cotton famine of 1861-4 and who remembered vividly the terrible hardships of those times ; how appallingly the whole industry suffered and how people starved rather than admit poverty—such was the pride of those days. It was by far the biggest calamity that had ever afflicted Lancashire. Yet we know how the industry pulled through and rose afterwards to great heights of prosperity.

And now again Lancashire is in a terribly plight, and the grandchildren of those brave old strugglers are going through a very difficult time. No one can foretell the future : we can only hope that this, like the earlier trouble, will be followed by much more prosperous times.

It would of course be easy and very pleasant to indulge in a little mild optimism. But we must recognise some new features that mark out this present trouble and distinguish it from all that has ever gone before. The difficulty is due to the excess of everything—excess, that is, beyond what the world at present can buy, and it is made worse for those interested in cotton by the widespread knowledge of how to work up cotton and make it into goods that people want. For a very long time Lancashire had a virtual monopoly ; now all the civilised countries, both of the East and the West,

can do some at least of their own spinning and weaving. No longer are India, China, Japan dependent upon us. They can produce a good deal of what they want themselves.

Yet Lancashire can still produce qualities of cotton goods that other countries cannot ; and all countries as soon as they begin to prosper shift their demands from rougher qualities to better qualities. And when this present depression passes—as it inevitably will, we may be quite sure of that—there will still remain as Lancashire's great asset its power of producing good quality stuff at relatively low prices.

In the meantime certain measures must be taken to safeguard Lancashire's position—measures of organisation, finance, marketing, which are altogether outside my province, and one measure which is definitely in my province : Lancashire must safeguard her future supplies of raw cotton. At the moment, this may seem unnecessary, raw cotton being unusually cheap. But this is not due, as your Chairman has pointed out, to extra production ; it is simply a fall in consumption. Sir James Currie has kindly given me the figures ; for the period 1912/14 the average annual world production was 26·8 million bales, and for the period 1929-31 it was only 27·7 million bales—barely a million more, much less than corresponds with the increase in the world's population. Moreover, there has been a marked fall in consumption, which still persists. But there is no reason why this reduced consumption should continue once the wheels of industry and commerce can get started. And besides the old markets there are immense tracts of Africa rapidly being opened up by motor transport and not yet fully exploited by the British manufacturer. This opening up of Africa has taken place in a remarkable way. Not long ago the important journey from Rejaf to Nimule occupied ten days, and now that same journey can be accomplished in a motor bus, which runs regularly, in one day. Let us hope that trade will follow the motor bus, and as these tracts

of Africa open up, so the demand for cotton goods will increase. Once the demand starts up again the supplies of raw material become of vital importance. It is of the greatest importance that you should control these supplies.

When the Corporation came into existence the situation was not altogether free from risk. By far the greatest producer of raw cotton was the United States, while Egypt and a very few other countries supplied the better qualities. The Corporation set out to broaden the basis of supplies, and it has been conspicuously successful in doing so. Only those who have tried to accomplish something in a tropical country can fully appreciate what it meant to establish cotton-growing in a country new to the crop, or to modernise its production in a country where it has long been grown by the natives. You have to find the kind of cotton that will grow well and that the market will take, and often enough this means breeding the cotton specially, because either the sort you want does not actually exist, or else there is not enough of it grown to ensure sufficient supplies of pure seed. The agricultural staff must get the soil into order and learn exactly what must be done in order to make cotton grow well. Cotton is fairly easy to please : it is indeed more tolerant than a good many other tropical crops, and it will stand a wide range of soil and subsoil conditions, but there are limits beyond which it will not grow, and these limits have to be discovered by long and careful experiments.

And then, perhaps worst of all, is the question of diseases and pests. No one who has worked in the Tropics needs to be reminded about the insects there. People in this country do not properly appreciate insects : you have to go to the Tropics for that. There you find insects of very many kinds in prodigious numbers. Some of them attack the cotton. Some cause direct damage to the plant, sucking the juices, eating the leaves and so reducing the crop, or damaging the bolls and thus lowering the value of the cotton. Others, and these are perhaps

worse, carry disease for which as yet no cure is known : these insects are worse than the others because a single one of them, exceedingly minute, can ruin an entire plant. And then there are diseases caused by fungi, and others by bacteria ; others again are very obscure and their origin cannot easily be traced.

This question of disease is particularly difficult because it is never ending. Transport and communications are now so efficient that it only needs a tiny fly somewhere on this earth to take a fancy to feed on the cotton plant and before long it is sure to be carried wherever cotton grows and if it can live in the new country it begins to thrive, like thoroughly undesirable aliens often do. You have only to think of the Rosetta disease, which reduced the crop of ground nuts in Gambia to about one-third of its normal level and did it very quickly ; or the virus diseases that in 1926 took 16 million bushels off the United States potato crop—or to come nearer home, the leaf curl disease that in 1931 did so much damage to cotton in the Gezira.

To establish a new cotton-growing industry in any country, therefore, is no easy business, and it is certain that development of cotton-growing in the Empire would have been much slower but for the fostering care of your Corporation. Your officers thoroughly explored the possibilities all over the Empire ; wherever conditions were suitable they encouraged development; where conditions were unsuitable they did not. They did not themselves set out to grow the cotton, but recognised the fact that the Agricultural Departments of the Empire have on their staff many enthusiasts who are prepared to try any promising new crop, given some encouragement and the specialised information necessary to ensure success, and this is what the Corporation supplied.

Directly an agriculturist starts working with a new crop he comes up against certain difficulties—the tricks of the plant, so to speak. If you give him time he will get round them himself, but it is far better and much quicker to arrange for

a few people to devote their whole time to finding out all they can about the plant—its strong points, its failings, the things it likes and the things it does not like, how it lives and how it feeds. But they must get this information absolutely correct, there must be no half-measures or uncertainties about it. These men are not out to make bigger or better plants, but to get trustworthy information that can be passed on to those growing the cotton, information that will save them much money and years of time. That is called long range research. There is nothing very abstruse about it; it is simply the work of getting trustworthy information. It is about the most economical investment that can be made because it saves time, and better still it saves many costly mistakes.

Very wisely the Corporation made provision for this kind of work. In 1926 they established a Research Station in Trinidad to get the kind of information about cotton that the expert would need wherever he was working, whether he was growing it in Africa or anywhere else. Dr. Harland took charge of the breeding side and Dr. Mason of the physiology side. These gentlemen are purveyors of information to all concerned.

Each important region, however, has its own range of problems, very important to the local growers, though not necessarily important to anybody else. These problems have to be studied at local research stations, which not only find out a good deal for themselves but also turn to their own use the information provided by Trinidad. They go straight to the business of growing good crops of the sort that the market wants. The Corporation runs several of these local stations. The most important is at Barberton in the Transvaal, where Mr. Parnell and his staff are breeding new varieties and finding out how best to grow them and keep them free from disease. They have been specially successful in dealing with one insect—a little thing called a jassid, which did great damage and

seemed incapable of control. They got round the difficulty by breeding a kind of cotton which the jassid does not like and which therefore it does not attack. Fortunately this variety grows well in other countries, so it is now the standard sort not only in the Low Veldt, for which it was bred, but also in Southern Rhodesia and Nyasaland, and it gives promise of success in Tanganyika, the Southern Sudan and Nigeria. One may hope that before long the boll worm also will be successfully dealt with.

In many of the important cotton-growing regions of the Empire—the Rhodesias, Nyasaland, Swaziland, the West Indies, Fiji, the Sudan—the Corporation provides help of this kind : varieties of cotton and methods of cultivation better than those already known.

Finally, since no machine will go on working without fresh supplies of men and material, the Corporation makes grants to four institutions in this country, Cambridge University, Manchester University, the Imperial College of Science and Technology, and Rothamsted, from all of which it draws specialists and specialised information about soils and plants which could not otherwise be obtained.

The work at Rothamsted illustrates very well the way in which a Research Station at home can help another far out in the Empire.

In all cotton-growing regions there are some soils which are suitable and others which are less suitable for the crop. At one time it was hoped that a simple method of analysis could be devised which would show at once the defects of the soil and how they might be made good. Years of experience and of disappointment have shown that this is not so ; there is no short and easy way of deciding about the suitability or otherwise of a soil. Of course you can find out by actually growing a trial crop, but that takes at least a year, it is expensive and not final because the season may always have been unfavourable.

You may want two or three years of test. It is far better to examine the soil itself. For this purpose the soil expert must be able to make a variety of tests, and someone has to devise these tests and discover in detail exactly what they mean. This kind of work is done at Rothamsted. Chemists and physicists obtain information about the properties of soil that affect the plant: the stickiness, the permeability to air and water, the movements of water and salt in the soil—these are things that make all the difference between success and failure of the cotton crop. They can be found out by bitter experience and years of financial loss, or they can be found out by well organised scientific investigation, and this is much cheaper and quicker besides being much more certain, because you thus get definite information as to how to deal with the difficulty when it arises. The problems are very difficult and the work is unending. Some of the biggest cotton-growing areas in the Empire are on some of the most difficult soils in the world, and we have not yet learned to manage them perfectly.

Another line of investigation at Rothamsted is concerned with the cotton disease known as Black Arm. It is caused by a very small germ or bacterium which was first observed in America, and so far as is known is a true-born American. In the United States it lives a comparatively blameless life and does no very great harm. But in some way or other it got into the cotton fields of Africa. How, no one knows. Perhaps in a packet of seed. But in this new African home it fairly painted the town red, doing great damage in the Sudan (*e.g.* in 1930–31), Nigeria and Uganda.

This difference in viciousness between the organism in its native home in America and in its adopted home in Africa seems to be largely a matter of climate. The first thing done by Mr. Stoughton at Rothamsted, therefore, was to try to find out how the disease is affected by climatic conditions, such as soil temperature, air temperature, and air humidity. For this

purpose special chambers were built—the Empire Marketing Board provided the money—in which some of the tropical conditions could be reproduced. The intense sunshine was provided by electricity; high soil temperature, high air temperature, and high humidity were all arranged for. But everything was so arranged that you could get lower or higher temperatures or humidities if you wanted, and also you could keep them constant or vary them as you liked. The whole climate, in fact, was under control: some of the chambers could be given a climate like the Sudan, others could have a climate like South Carolina. These experiments showed that the taking of the disease by the little seedlings was most complete at rather low soil temperature (below 30° C., which is cool for the tropics). The spread of the disease was most complete at high humidities, and the growth of the disease in the adult plants, once the plants had taken it, was most complete at high air temperatures. It took a long time to disentangle the information, but that is just the kind of information wanted by the expert on the spot. He knows what to expect, and does not get caught unawares. It is, of course, true that in Nature one cannot control temperature or humidity, but there are many things an ingenious expert can do. He can try to dodge the worst attacks of the disease. If he knows the conditions that cause trouble, he can often find some way of avoiding the worst of those conditions and so mitigate the evil.

We should all of us have been dead long since—indeed probably we should never have been alive—but for the fortunate circumstance that plant disease and pests have some weak link in their chain of life where they can be attacked with some hope of success. We have got men at Rothamsted who have spent years investigating one minute organism; they find its weak points and attack it there. There is, for example, another Sudan problem—leaf curl—a curious virus disease quite incurable but fortunately largely preventable because it is

carried by a very small white fly, and if only this could be kept under control the disease would not spread. One cannot, of course, keep the flies away, but happily Mr. Kirkpatrick, in the Sudan, was able to detect the particular weakness in its life history, and to show how it could be starved out by using a two years' fallow and not letting forage crops grow near the cotton. There was a certain stage when the insect had to live on forage crops which were grown alongside the cotton. When the fly was off the cotton the other crop was there for it to go on to. Mr. Kirkpatrick discovered the habit it had of passing from one to the other, and the fly was controlled by abolishing these other crops. The simple expedient was to have a long fallow and not let the forage crops grow near the cotton. This has been done, and an excellent yield of cotton has been obtained, though of course one cannot say with certainty that the high yield is *because of* the control, because no two seasons are ever quite alike in the Sudan. This scheme of abolishing the forage crops has, however, complex reactions on the cultivators, and that new problem has still to be solved.

But the best way is to breed a new kind of cotton plant that will not take the disease and yet will give exactly the kind of cotton that you want. Almost certainly it can be done, but it takes time and patience.

There are fortunately a great many diseases for which you can find resistant or even immune plants. These plants in the first instance may not always be suitable for the market; nevertheless they can be crossed with good market varieties, and very often the resistance or the immunity can be carried on in the progeny. That is the work which has been done by plant breeders. Mr. Bailey, in the Sudan, has been conspicuously successful in some of his plant-breeding work. These plant breeders, not only in the Sudan but in Trinidad and elsewhere, are finding varieties of plants resistant to these diseases and at the same time giving the kind of cotton wanted. That is the

best way of dealing with these problems of diseases and pests. But, of course, it takes time. It takes a whole year for the plant to grow and produce its seed, and you have to examine the progeny and subject it to severe tests before you know whether it is exactly what you want.

The great point is this. You must have ample supplies of raw cotton. You may not want them to-day, but you certainly hope you will need them in the near future. There are now in the Empire a number of cotton-growing regions on which a good deal of British money has been spent: the Gezira is a notable example. There will always arise difficulties in trying to grow big crops of cotton over large areas, but they can all be met. It means constant vigilance, for no sooner is one trouble over than another appears. It is, in short, exactly like a big business; it always wants watching, and it never reaches the stage when it runs itself. This vigilant help and expert guidance is what your Corporation provides, and I sincerely hope that no matter how difficult the times may be, you will ensure that your Corporation may continue to serve this purpose of a thinking staff, and continue helping by advice and guidance those who are trying to provide adequate supplies of raw cotton from the Empire.

THE CHAIRMAN: It will be your wish that I should express our most grateful thanks to Sir John Russell for the very interesting address he has given us. (Applause.)

Our business for to-day is concluded, but I do not think we ought to part—and I am sure you would not wish to do so—without extending our grateful thanks to Sir Richard Jackson, Sir James Currie and our staff for the work they have done on our behalf. We are fortunate in having in them, people devoted to the Corporation's interests, giving time and energy to the advance of this work, and we owe them a very

deep debt of gratitude. I will not put that as a resolution, but I am sure it will have your unanimous endorsement. (Applause.)

Sir Richard Jackson : I thank Lord Derby for what he has said. I do not know whether it is all deserved, but we are doing our best to carry on ; and now we must pay him a vote of thanks for his conduct in the Chair this afternoon.

The vote of thanks was heartily accorded, and the proceedings terminated.